DRAFT ENVIRONMENTAL ASSESSMENT

WATER INTAKE FACILITY ON MELTON HILL RESERVOIR FOR HALLSDALE POWELL UTILITY DISTRICT ANDERSON COUNTY, TENNESSEE

TENNESSEE VALLEY AUTHORITY
U. S. ARMY CORPS OF ENGINEERS

JULY 2002

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The Proposed Decision

Hallsdale Powell Utility District (HPUD) is proposing to construct and operate a raw water intake structure at Clinch River Mile 46.3 and Bull Run Creek Mile 2.0 on the Melton Hill Reservoir in Anderson County, Tennessee. The Tennessee Valley Authority (TVA) must decide whether to approve the project under Section 26a of the TVA Act, and the U. S. Army Corps of Engineers (USACE) must decide whether to approve the project under Chapter 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act.

Background

On February 22, 2000, HPUD of Knoxville, Tennessee, submitted a joint TVA and USACE application for approval of a water intake structure and sediment excavation at Bull Run Creek Mile 2.0 on the Melton Hill Reservoir in Anderson County, Tennessee (Attachment 1). Currently, HPUD operates a water intake system upstream of the proposed site at mile 3.9 on Bull Run Creek. Built in the late 1960s, the existing intake withdraws up to 8 million gallons per day (mgd). The utility supplies potable water to about 23,000 residents and businesses in north Knox, Anderson, and Union Counties. These areas continue to increase in population and water use. Siltation and decreasing water quality in Bull Run Creek are expected to limit the amount of water available from the existing intake. The new intake would allow HPUD to meet expected potable water demands for the foreseeable future. The existing intake at Bull Run Creek Mile 3.9 would remain as a back-up unit.

Other sites on the reservoir considered by the applicant would not fulfill the project requirements or would not offer any environmental advantage over the proposed site: (1) the use of another stream in the area like Bull Run Creek was not feasible because of inadequate water volume and the potential for problems similar to those at HPUD's existing intake; (2) an existing West Knox County Utility District intake on Melton Hill Reservoir has excellent water depth but was eliminated from further consideration because of potential turbidity concerns, higher energy use, and the need to install new equipment and about twice the distance of pipeline as the proposed site; (3) a site considered on private property 1,200 feet upstream of the proposed site at Henderson Road Bridge would have needed less than half the pipeline but had 3 feet less water depth and a difficult access; and (4) a potential site on TVA property in the vicinity of the Henderson Road Bridge would have had acceptable water depth but would have necessitated an allocation change in the designated use of the land as described in the Melton Hill Reservoir Land Use Plan (TVA, 1999), required more infrastructure for the facility, and had the potential to directly impact the adjoining recreation area licensed to Anderson County.

The proposed structure would be constructed on private land with the intake pipes placed on TVA property. The extent of development on TVA property would be a buried pipe and submerged intake structure on tract number XMHR-80PT, lying between the proposed structure and Melton Hill Reservoir. This property, a narrow strip of land bordering the reservoir, was designated in the Melton Hill Reservoir Land Use Plan for residential access (Zone 7) (TVA, 1999). However, historically, TVA allows utility crossings and water access on public land where the proposed facilities provide a public benefit or are compatible with the existing land uses. TVA has concluded the proposed intake installation would be compatible to the existing land use allocation and consistent with similar structures considered under residential uses.

HPUD is proposing to build a raw water intake facility consisting of an intake structure and piping that would extend into the lake along the bottom contour. The intake structure would be approximately 30 feet wide by 40 feet long and 10 feet high. The building structure would be made of poured-in-place, naturally tinted concrete with a stone pattern. The structure would include two 800 horsepower motors and pumps, with capacity for a third. The structure would have sound-absorbing materials and design as well as air conditioning equipment. The intake would initially withdraw approximately 8 mgd, with a capacity of 14 mgd. The structure could be upgraded to withdraw up to 22 mgd with the addition of the third motor and pump as future demand dictates. All permits and approvals are based on the maximum capacity of 22 mgd.

The proposed structure would support two 36-inch pipes extending 270 feet to the middle of the channel of Bull Run Creek. The screen at the ends of the pipes would be 4 feet in diameter, with a 0.125-inch mesh, and 6.5 feet long, which includes a bullet nose protector to keep debris from fouling the screen. The pipes would be trenched below the reservoir bottom to near elevation 785 feet with a temporary cofferdam constructed to facilitate the installation. The remaining length of pipes would be anchored along the reservoir bottom to the channel with concrete anchors placed at 20-feet intervals. All excavation for the piping and structure would take place inside the limits of the temporary cofferdam. The shoreline will be returned to its original condition. All excess excavated material would be removed to an approved upland disposal site. There would be a warning sign and buoy over the intakes to notify boaters of the intake location.

In addition to approvals from TVA and USACE, approval would also be sought from the Tennessee Department of Environment and Conservation (TDEC) under Section 401 of the Clean Water Act of 1977, certifying that applicable water quality standards will not be violated.

In accordance with the National Environmental Policy Act (NEPA), Council on Environmental Quality regulations, and TVA implementing procedures, TVA has assessed the potential impacts of the project on the human environment. There has been no previous environmental review at this site by TVA. Additional details of the proposed federal action can be found in the attached Joint Application (Attachment 1) and Environmental Decision Record (EDR) (Attachment 2). Many actions of this type would normally qualify for categorical exclusion under Section 5.2.26 of TVA's NEPA procedures, "Approvals under Section 26a of the TVA Act of minor structures, boat docks, and shoreline facilities." However, because of the potential to impact noise, water quality, and visual resources at this site, and to better understand the impacts of its decision, TVA has elected to prepare this Environmental Assessment (EA).

Regulatory Authorities and Requirements

TVA

Section 26a of the TVA Act of 1933, as amended, requires approval by TVA for construction of facilities in, along, or across the Tennessee River and its tributaries.

USACE

Chapter 10 of the Rivers and Harbors Act of 1899 prohibits the alteration or obstruction of any navigable waters of the United States unless authorized by USACE, and the Clean Water Act of 1977, as amended, prohibits the discharge of dredged or fill material into waters of the United States without a Section 404 permit from USACE.

Public Involvement

USACE, TVA, and the state of Tennessee issued a joint public notice (01-62) on August 9, 2001 (Attachment 3). In response, the U.S. Fish and Wildlife Service (USFWS) said in a September 6, 2001, letter (Attachment 4) that there were no threatened or endangered species in the project area and that the requirements of the Endangered Species Act were fulfilled. In an October 29, 2001, letter (Attachment 5) the Tennessee Historical Commission (THC) informed TVA they had no objection to the project since no historical properties would be affected. Also, TVA, USACE, and HPUD received 67 letters or e-mails and several phone calls from interested individuals who opposed the project. Many of these individuals had residences in the vicinity of the proposed water intake structure. Their concerns were the potential for noise from the intake pumps; visual impacts to the area; loss of property values; impacts to water recreation; the safety of swimmers and boaters; the apparent shallowness of water at the proposed site; the potential for an increase in the fluctuation of water levels; a potential decrease of water levels in Bull Run Creek; the use of alternative sites; and impacts to wildlife, wetlands, water temperature, and water quality. In addition, many of the commenters asked for a public meeting to further understand the project and express their views.

A notice of a public meeting appeared on the TVA Web site starting January 8, 2002, and in the *Knoxville News-Sentinel* on January 20, 2002, informing the public that a hearing would be held on January 24, 2002, and that the comment period closed February 15. HPUD, TVA, and USACE held a public meeting sponsored by HPUD on January 28, 2002, at Claxton Elementary School in Anderson County, Tennessee. Thirty-two of the people present registered. A stenographer recorded the presentations of the speakers and comments of the 16 people who spoke (Attachment 6). During the meeting and subsequent comment period 70 written comments were received from individuals about the project. On March 18, 2002, the Anderson County Board of Commissioners passed a resolution opposing the construction of an intake facility at this site. There were comments, not mentioned before, on the responsibility and capability of TVA to enforce the conditions of any permit and that the proposal was not consistent with the recently released Melton Hill Reservoir Land Use Plan (TVA, 1999). HPUD provided follow-up letters with project information to those individuals who registered at the meeting and provided responses to concerns by the permitting agencies and other interested individuals. Further, HPUD addressed comments at a March 5, 2002, Melton Hill Lake Users Association meeting that was attended by the public. The issues are further addressed in the EA.

Scoping

The public response to the proposal focused on the potential socioeconomic effects to private property and potential effects to natural resources in the Bull Run Creek estuary. The issues and information identified during scoping were used by TVA to identify environmental impacts associated with the project. Because of the nature of the project, TVA has determined there would be no waste stream generation or alteration. Likewise, TVA has determined there would be no potential effect to transportation, stream modification, wetlands, historic structures or sites, archaeological resources, or protected and sensitive plant or animal species. Impacts to terrestrial and aquatic ecology would be minor and temporary provided conditions were implemented to minimize the impact to the environment.

A change to the 1999 Melton Hill Land Use Plan would not be required for HPUD to use the TVA land for their proposal. The proposed pipelines and intakes would be placed on TVA land allocated for residential access use. However, since the proposed pipelines and intakes would be buried or submerged, there would be minimal impact to any typical uses associated with residential access, such as, pathways, ramps, docks, or boathouses. Therefore, TVA has concluded the proposed intake installation would be compatible to the existing land use allocation and consistent with similar water access facilities considered under residential uses.

Water intake operations would temporarily interfere with fishing or other recreation activities during construction or the brief periods of routine flowback maintenance. The intakes are not likely to trap or harm a swimmer or boat. The intakes would be marked with buoys and signs and in sufficient water depth to avoid boating accidents.

Since the proposed facility would be fenced and is across the road from the launching ramp, neither the construction nor operation of the facility would prevent or affect the use of the boat ramp for its intended purpose.

The intake would have adequate water depth for water collection and boating safety if placed in the main channel of Bull Run Creek.

Water from the main Melton Hill Reservoir would enter Bull Run embayment to replace any extracted water but would not significantly affect the ambient water temperature or the operation of Bull Run Fossil Plant and its compliance with the thermal limits of its National Pollutant Discharge Elimination System permit.

Noise, visual resources, and water quality are substantive issues of public concern that could be affected by construction of a water intake structure at the Bull Run Creek site. Further study of the effects of the proposal on these resources will be analyzed and disclosed in the EA.

Alternatives and Comparison

Action Alternative

The proposed action is to issue a Section 26a approval to HPUD to allow construction and operation of a water intake at Clinch River Mile 46.3 on Melton Hill Reservoir. Maps, plans, and a description of the project are included in the attached EDR (Attachment 2).

No Action Alternative

Under the No Action Alternative, TVA would not issue a Section 26a permit.

Comparison of Alternatives

If the proposed action were completed, the construction and operation of a new water intake structure would occur, and HPUD would be able to increase its ability to supply water to the north Knox, Anderson, and Union county areas to match predicted future demands. If the No Action Alternative were adopted, the water intake would not be constructed, and HPUD would have to find other sources of raw water or may not be able to supply future water needs.

Summary of Impacts Under the Proposed Action Alternative

- There would be minor and temporary siltation and runoff increases in the construction area and downstream.
- There would be other minor impacts to the environment as noted in the EDR and EA.
- HPUD would be able to increase its water supply capability to better match increasing residential and commercial demand.

Summary of Impacts Under the No Action Alternative

- There would be no environmental impacts caused by construction of a new facility.
- The utility could still operate the existing water intake maintaining current levels. However, there would be less likelihood of the utility being able to supply water to meet future residential and commercial development.

Affected Environment

Site Description

The site is on private property near the New Henderson Road Bridge over Bull Run Creek Mile 2.0 on the Melton Hill Reservoir. An access ramp, courtesy dock, and recreation area licensed to Anderson County is directly across New Henderson Road. The property has been used for agriculture (pasture/hay) for several years. Access to the site would be from New Henderson Road. There are no residences or other buildings adjacent to the proposed site; however, there are several residences within view upstream or across Bull Run Creek (Anderson County). Bull Run Fossil Plant is within 1 mile downstream of the proposed site. The land use in the immediate area consists of low density residential, small agricultural fields, and woodlots. The nearest communities are Oak Ridge about 3-4 miles to the west across Melton Hill Reservoir, and Claxton about 2 miles east on Highway 63.

Generally, the valleys and lower ridge slopes of this province have been cleared for agricultural use. The broader valleys support the more productive farms; yet, even the narrowest valleys support subsistence farming. Lower slopes, and in some cases the ridges themselves, have been cleared for pasture or hay production. Row crops are typically restricted to the broad valley floors. Generally, the ridges are forested, although some areas have been repeatedly logged.

Water Quality

Melton Hill Dam is located on the Clinch River at river mile 23.1. The drainage area upstream of the dam is 3,343 square miles. Rainfall in the area averages about 47 inches per year, with March being the wettest month with 5.1 inches, and October the driest with 2.8 inches. The average monthly air temperature ranges from 36°F in January to 77°F in July, with a mean for the year of about 58°F. Stream flow varies with rainfall and reservoir operations, with an annual average of about 4,900 cubic feet per second (cfs). During the last 40 years, the mean annual flow at the dam has ranged from 2,100 cfs in the driest year to 8,100 cfs in the wettest year.

Melton Hill Reservoir is 44 miles long, with a maximum depth of 65 feet at the forebay. It has a surface area of 5,690 acres and impounds 120,000 acre-feet at the normal maximum pool elevation of 795 feet (mean sea level). At the average flow rate and water surface elevation, the reservoir has a mean depth of 21 feet and a hydraulic residence time of 11 days. TDEC classifies Melton Hill Reservoir downstream of Bull Run Creek for domestic and industrial water supply, fish and aquatic life, recreation, irrigation, livestock watering and wildlife, and navigation. The reservoir is on the state 303(d) list as not supporting its designated uses due to polychlorinated biphenyls (PCBs), chlordane, and siltation from contaminated sediment and industrial point sources. The state advises against eating catfish from the reservoir because of PCB contamination. There are no swimming advisories on Melton Hill Reservoir. Fecal coliform bacteria levels in samples collected by TVA in 2000 exceeded state water quality criteria for water contact recreation at three of the six sites sampled.

Bull Run Creek, upstream and immediately downstream of the project area, is classified by the state for domestic water supply, fish and aquatic life, recreation, irrigation, and livestock watering and wildlife. Foster Branch and Williams Branch of Bull Run Creek are on the state 303(d) list as not supporting designated uses due to siltation from resource extraction.

Noise

The proposed site is a small lot located immediately adjacent to and east of New Henderson Road in Anderson County, Tennessee. A farm or pasture (the Duncan property) borders the site on the south and east with Bull Run Creek (Melton Hill Reservoir) on the north. The nearest residence is approximately 700 feet from the proposed site on the same side of the creek. On the opposite shore are residences approximately 750 feet from the proposed site. The intake structure would include two 800 horsepower motors and pumps, with capacity for a third. The structure will be 12 feet from the Duncan property line on the east side and 7 feet away on the south side. Both day and night, intermittent operations of the intake would take place as dictated by district water use with some seasonal sound-level variation expected.

Visual Resources

The visual character of the surrounding area is a mix of open fields, large homes, broad lawns, and a few private docks, interwoven with a woodland background. The area slopes gently to the water and is surrounded by moderately steep, wooded hills. The plant stack at Bull Run Fossil Plant and several transmission line towers are visible above the ridge tops. Together, these elements form a tranquil, generally harmonious, rural residential landscape.

The site is located on the south side of the embayment, at the bridge along Henderson Road. It is an open, grassy area that is part of a larger field, with a tree and some brush near the water. A public boat launching area is located west across the road. Visual integrity is low, and scenic value is fair. The parcel is seen in the foreground from several surrounding homes, the launching area, boats in the embayment, and passing motorists on the road.

Environmental Consequences

Water Quality

Construction activities associated with the proposed project could result in soil disturbances, with a potential for adverse water quality impacts. Erosion and sedimentation from the intake construction could increase turbidity and threaten aquatic life. Removal of the tree canopy adjacent to the shoreline could increase water temperatures.

Safeguards would be included in the project design, construction, and maintenance to minimize these potential impacts. Best Management Practices would be followed to control erosion, sedimentation, and turbidity associated with construction activities and installation of the intake facilities. Any vegetation along the shoreline would be left undisturbed unless there is no practicable alternative.

There is also a potential that water withdrawals could affect stream flows, water levels, water temperatures, and other water quality conditions. Bull Run Creek has a drainage area of 104 square miles and a mean annual flow of about 62 cfs. The proposed water intake is located approximately 2 miles upstream of the mouth of Bull Run Creek. Stream flow records from a United States Geological Survey gauging station at Bull Run Creek Mile 16.3, with a drainage area of 68.5 square miles, indicate a mean annual flow of 40.8 cfs and a 7-day, 10-year low flow (the minimum 7-day low flow that occurs once in 10 years) of 5.29 cfs.

The withdrawal of 22 mgd (34 cfs) from Bull Run Creek would not be a significant concern because of the abundance of water from the Melton Hill Reservoir. The reservoir extends up Bull Run Creek several miles upstream of the intake location, providing year-round water from the reservoir rather than solely from the flow of the creek. During periods of low flow in Bull Run Creek, and during other times, the intake will withdraw significant amounts of reservoir water from the Bull Run embayment. This movement of reservoir water, into the embayment, could actually benefit water quality by increasing reservoir circulation. Water temperatures and lake levels would not be altered significantly, since the net withdrawal of about 15 cfs is small relative to the average reservoir flow (4,900 cfs) and the reservoir volume (TVA, 2001).

Noise

In order to minimize impacts from noise, the design goals of the facility would be not to exceed the background sound level at the property line by more than 3 decibels (dB) and to keep the sound level of the facility at the property line below 55 decibels A-weighted scale (dBA). A noise study conducted by Bowlby & Associates, Inc., established a background sound level for the site (Attachment 7). With a background sound level of 54 dBA, the second criterion of keeping the noise level at the property line below 55 dBA was demonstrative in assessing noise abatement measures. Bowlby & Associates concluded

that without noise abatement, operations at the facility would exceed 55 dBA. Consequently, they recommended noise abatement methods that could be incorporated into the design of the structure. These recommendations were incorporated into the proposed design of the intake structure and would result in noise levels sufficiently below 55 dBA to provide a margin of safety. Based on this analysis, the potential environmental noise effects of the proposed action are insignificant.

Visual

Under the proposed project, the visual character of the rural landscape would not change much, and the potential impact would be insignificant. Visual integrity and scenic value of the area would remain about the same. Earthwork, material stockpiles, and construction activities would temporarily add visual discord until completed final project cleanup. The completed building and screen fencing would be a relatively small facility and would easily blend with the residential scale of surrounding development. The facility would be seen from the same locations described under the Existing Environment Section. Light-colored stone and fencing materials, shown in the architectural concept, would add moderately discordant visual contrast. The contrast could be minimized by using brick for the building and selecting darker tones of muted, natural red-brown colors for both brick and fence materials. Use of these colors along with the proposed dark gray shingled roof would repeat the predominant materials of nearby homes for greatest visual compatibility. The roof parapet is expected to be high enough to screen views of roof-mounted heating, ventilation, and air conditioning (HVAC) units and other mechanical equipment. Planting additional trees would provide an attractive, intermittent buffer in the future.

Cumulative Impacts

The physical effect of the proposed action is limited in scope and is restricted to one site. The withdrawal of 22 mgd of water from Melton Hill Reservoir would not affect the amount of water currently available for other purposes. If current population and migration trends continue, the need for potable water for residential and commercial use will likewise increase. This increase in urban development is likely to further reduce existing vegetation cover, which could continue to increase siltation and decrease water quality and volume in the area's streams, regardless of which alternative is selected. Although it would have a somewhat greater impact than the No Action Alternative, the Action Alternative would result in a minimal impact on the environment. Therefore, TVA has determined that cumulative impacts of this action would be insignificant.

Mitigation Measures

No significant effects are expected to occur from the proposed project provided mitigation measures outlined below are implemented. The Section 26a permit for this action will include these measures or special conditions.

1. All construction and maintenance activities will take place during winter-pool, low-water conditions from October through March.

2. All disturbed areas will be stabilized within 30 days of completion of the work authorized. All land-disturbing activities shall be conducted in accordance with Best Management Practices as defined by Section 208 of the Clean Water Act to control erosion and sedimentation to prevent adverse water quality and related aquatic

impacts. Such practices shall be consistent with sound engineering and construction principles; applicable federal, state, and local statutes, regulations, or ordinances; and proven techniques for controlling erosion and sedimentation, including the following:

A. The removal of vegetation will be minimized, particularly any woody vegetation providing shoreline/streambank stabilization.

B. Cofferdams and/or silt control structures between construction areas and surface waters will be installed prior to any soil-disturbing construction activity, and clarification of all water that accumulates behind these devices will be done to meet *state* water quality criteria *at the stream mile where activity occurs* before it is returned to the *unaffected portion of the stream*. Cofferdams must be used wherever construction activity is at or below water elevation.

C. Equipment will be kept out of the reservoir or stream and off reservoir or stream banks, to the extent practicable (i.e., performing work "in the dry").

D. Contact of wet concrete will be avoided with the stream or reservoir, and disposing of concrete washings, or other substances or materials, in those waters will be avoided.

E. Erosion control structures will be used around any material stockpile areas.

F. Clean/shaken riprap or shot rock will be applied (where needed at water/bank interface) over a water permeable/soil impermeable fabric or geotextile and in such a manner as to avoid stream sedimentation or disturbance, or that any rock used for cover and stabilization shall be large enough to prevent washout and provide good aquatic habitat.

G. Remove, redistribute, and stabilize (with vegetation) all sediment which accumulates behind cofferdams or silt control structures.

H. Vegetation (versus riprap) will be used wherever practicable and sustainable to stabilize streambanks, shorelines, and adjacent areas. These areas will be stabilized as soon as practicable, using either an appropriate seed mixture that includes an annual (quick cover) as well as one or two perennial legumes and one or two perennial grasses, or sod. In winter or summer, this will require initial planting of a quick cover annual only, to be followed by subsequent establishment of the perennials. Seed and soil will be protected as appropriate with erosion control netting and/or mulch and provided adequate moisture. Streambank and shoreline areas will also be permanently stabilized with native woody plants, to include trees wherever practicable and sustainable (this vegetative prescription may be altered if dictated by geologic conditions or landowner requirements). You also agree to install or perform additional erosion control structures/techniques deemed necessary by TVA.

3. Intake will be screened with openings no larger than 1/8 inch, and sized so that velocities through the screen do not exceed 0.5 feet per second.

4. All excess excavated material will be removed to an approved upland disposal site.

5. Noise abatement recommendations as described in the October 26, 2001, Bowlby & Associates, Inc., report will be implemented in the design of the water intake structure.

6. Changes to the noise abatement recommendations identified in the Bowlby & Associates, Inc., report will require that another sound analysis be conducted to determine if the new design meets the performance criteria and approval by TVA.

7. Visual impacts will be minimized by using brick for the building and selecting darker tones of muted, natural red-brown colors for both brick and fence materials. The roof parapet will be built high enough to screen views of roof-mounted HVAC and other mechanical equipment.

8. A standard regulatory hazard buoy will be installed and maintained at the end of the intake. The word "intake" will be added to the buoy and be attached using a 5-foot cable.

Preferred Alternative

TVA's preferred alternative is to permit the construction and operation of the water intake.

TVA Preparers

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Agencies and Others Consulted

United States Army Corps of Engineers, Regulatory Branch, Nashville, Tennessee

United States Fish and Wildlife Service, Cookeville, Tennessee

Tennessee Historical Commission, Nashville, Tennessee

References

Tennessee Valley Authority. 1999. Melton Hill Reservoir Land Use Plan.

Tennessee Valley Authority. 2001. Aquatic Ecological Health Determinations for TVA Reservoirs - 2000.

Attachments

1. Joint Application and Plans (560 kb, PDF)
2. Environmental Decision Record RLR 100330, Hallsdale Powell Utility District, Water Intake Structure, TVA, Lenoir City, Tennessee, April 2002 (24 kb, PDF)
3. Joint Public Notice (628 kb, PDF)
4. USFWS Letter (104 kb, PDF)
5. THC Letter (80 kb, PDF)
6. Public Meeting Notice, Outline, and Information (304 kb, PDF)
7. Bowlby & Associates, Inc., Noise Study (948 kb, PDF)